

June 29, 2000

Mr. James Chang (SFD-8-1)
U.S. Environmental Protection Agency
Region IX
75 Hawthorne Street
San Francisco, CA 94105

**Subject: Contract No. 68-W-98-0220 / WA No. 220-11-Q7LW
George/Norton Air Force Base Work Assignment
Split Sampling Report, November 1999 Groundwater Sampling Event,
George Air Force Base**

Dear Mr. Chang,

Enclosed is the Split Sampling Report, for the November 1999 Groundwater Sampling Event at George Air Force Base. Groundwater samples were collected by Mr. Jim Cureton of TechLaw on November 16, 1999. The groundwater samples were analyzed by NEL Laboratory in Reno, Nevada.

This report is being forwarded to you through electronic mail (via Internet) in WordPerfect® Version 8.0 format. A hard copy of the evaluation will also be submitted with this cover letter. TechLaw understands you will review and augment the evaluation at your discretion.

Thank you for the opportunity to provide U. S. EPA with technical oversight services at George Air Force Base. TechLaw looks forward to working with you in the future. Should you have any questions, please call me at (415) 281-8733.

Sincerely,

James Cureton, R.G.
Site Manager

copy to: Angela Commisso, U.S. EPA Region IX w/o attachment
 P. Brown-Derocher, TechLaw/Central Files
 Joe Eidelberg, U.S. EPA Region IX

**GEORGE AIR FORCE BASE
Victorville, California**

**Split Sampling Report, November 1999 Groundwater Sampling Event,
George Air Force Base**

Submitted to:

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Contract No.
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June 29, 2000

**Split Sampling Report, November 1999 Groundwater Sampling Event,
George Air Force Base**

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Split Sampling Report, November 1999 Groundwater Sampling Event, George Air Force Base, California

1.0 Introduction

This report contains a summary of TechLaw's split sampling activities performed at George Air Force Base in Victorville, California. U.S. EPA requested that TechLaw conduct groundwater split sampling during the November 1999 groundwater sampling event at George Air Force Base. Sampling was conducted in accordance with TechLaw's "Split Sampling Plan" dated October 22, 1999. The split sampling activities were performed under U.S. EPA Contract No. 68-W-98-220 and U.S. EPA work assignment No. 220-11-Q7LW.

This report presents the scope of work, the split sampling procedures, and the analytical results of groundwater split samples collected during the November 1999 groundwater sampling event.

2.0 Scope of Work

Four monitoring wells were sampled during the split sampling event. Table 1 summarizes the wells sampled and analyses performed. Mr. Jim Cureton, of TechLaw, Inc. conducted the split sampling activities on November 16, 1999.

The rationale for sampling each well is summarized below:

MW-45: Confirm detection of ethylene dibromide (EDB) in the split sample collected by EPA from MW-45 in November 1998 (0.019 $\mu\text{g/l}$). Determine accuracy of George AFB TPH and benzene, toluene, ethylbenzene, and total xylenes (BTEX) data. Evaluate appropriateness of defined TPH levels for cleanup goals.

MW-61: Monitor dieldrin at a location upgradient of NZ-63 and NZ-66. Determine accuracy of George AFB volatile organic compound (VOC) data.

NZ-39: Monitor relatively high concentration of TCE in the upper aquifer.

NZ-51: Monitor edge of TCE plume at FT-20

3.0 Field Work

The TechLaw representative conducting the field sampling was Mr. Jim Cureton who served as the Field Team Leader and Site Safety Officer.

George Air Force Base and contractor staff present during the groundwater sampling included:

Harold Reid, George AFB
Calvin Cox, TN & Associates
Suzanne Davis, HydroGeoLogic
Kelly Gragg, HydroGeoLogic, Inc.
Sheri Mazur, HydroGeoLogic, Inc.
Gilbert Dimidjian, Montgomery Watson
Chip Poalinelli, Montgomery Watson

3.1 Split Sampling Procedures

Kelly Gragg and Sheri Mazur, of HydroGeoLogic, conducted the purging of wells MW-61 and MW-45. Purging of wells MW-61 and MW-45 was observed by Jim Cureton, who was also present for the collection of the split samples. Wells MW-61 and MW-45 were purged using the modified micro-purge technique. Pumping rates were approximately 0.5 to 1.0 liters/minute. Indicator parameter and groundwater level measurements were collected approximately every three minutes. Purging of the monitoring wells took approximately one hour. The Air Force sample containers and the split sample containers were alternately filled during collection. After all of the sample containers were filled, the containers were labeled and placed on ice in a cooler. Monitoring well NZ-51 was sampled by a second HydroGeoLogic sampling crew at the same time as monitoring well MW-61. Monitoring well NZ-39 was sampled by the Montgomery-Watson sampling crew at the same time as monitoring well MW-45 was sampled. The split sample at well NZ-51 was stored in an ice-filled cooler and delivered to Jim Cureton approximately 25 minutes after being collected. The split sample collected at NZ-39 was delivered to Jim Cureton in an ice-filled cooler by Montgomery-Watson personnel at the end of the day on November 16.

Samples were carefully packaged in bubble wrap and stored in coolers filled with ice. Custody seals were affixed to the front and back of each cooler. The samples were sent via overnight delivery to NEL Laboratory (NEL) in Reno, Nevada on November 17, 1999. NEL Laboratory is used by the Lahontan Regional Water Quality Control Board and was selected because funding was not available to use the U.S. EPA Regional Laboratory or the Contract Laboratory Program. The groundwater samples collected by TechLaw were sent to NEL as Lahontan Regional Water Quality Control Board samples.

3.2 Quality Control/Quality Assurance Samples

Quality control samples were collected in accordance with the Split Sampling Plan, Basewide Groundwater Monitoring Program November 1999 Event, George Air Force Base (TechLaw, 1999). Duplicates were collected at a rate of one per ten samples collected with at least one field duplicate and one equipment blank sample collected for each type of analysis. The equipment blanks were collected by pouring DI water over the sampling pump and allowing the water to collect in sample containers. The equipment blanks were collected immediately following decontamination of the pumps.

Trip blanks were collected at a rate of one for each shipment. Trip blanks consisted of reagent grade DI water in 40 ML vials and were supplied by HydroGeoLogic's laboratory contractor. One matrix spike/matrix spike duplicate (MS/MSD) sample was also collected. Two performance evaluation (PE) samples were submitted to the laboratory for VOC and EDB analysis. The PE samples were supplied by Analytical Products Group, Inc. of North Olmsted, Ohio. Finally, a standard supplied by Montgomery Watson representatives was submitted to NEL for TPHd analysis. The laboratory reported a 96% recovery for this standard indicating that the analytical method (8015B) was accurately recovering TPHd compounds. Table 2 summarizes the quality control samples collected at each monitoring well.

4.0 Analytical Results

Groundwater samples collected by EPA were analyzed by NEL Laboratory. The analytical results for the samples collected by the Air Force were supplied to TechLaw, by the Air Force's contractors, Montgomery Watson of Walnut Creek, California and HydroGeoLogic, Inc of Sacramento, CA. Note, that TechLaw did not perform a quality

control review of the the Air Force's analytical results.

4.1 Ethylene Dibromide

One sample, from well MW-45, was analyzed for EDB using EPA Method 504.1. EDB analytical results are presented in Table 3. Concentrations of EDB were 0.0169 $\mu\text{g/l}$ and 0.0166 $\mu\text{g/l}$ for the primary and duplicate samples, respectively. George AFB results for EDB at MW-45 were non-detect, however, the detection limit was 100 $\mu\text{g/l}$. The results confirm the detection of EDB at MW-45 during the November 1998 split sampling event.

4.2 Total Petroleum Hydrocarbons

Samples from monitoring well MW-45 were analyzed for TPH as gasoline (TPHg) and TPH as diesel (TPHd). The laboratory used a TPHg range of C6 to C10 and a TPHd range of C10 to C28. The carbon ranges were the same as those used by the Air Force's analytical laboratory. Concentrations of TPHg were significantly higher than TPHd at MW-45. The TPH analytical results are presented in Table 4. Concentrations of TPHd were measured in the primary and duplicate samples at 2.2 mg/l and 2.5 mg/l, respectively. TPHg was detected at 41 mg/l and 40 mg/l for the primary and duplicate samples, respectively. The TPHg values exceeded the calibration curve and were qualified E by the laboratory. Therefore, the reported TPHg values should be considered estimated and possibly biased low. Additionally, TPHg was detected at a concentration of 0.06 mg/l in the equipment blank sample. Since TPHg sample concentrations are approximately three orders of magnitude greater than the blank value, sample data does not require qualification.

4.3 Volatile Organic Compounds

Samples from MW-45, MW-61, NZ-39 and NZ-51 were analyzed for VOCs by SW-846 Method 8260B. Table 5 presents VOC analytical results. Trichloroethene was detected in samples NZ-39 and NZ-51 at 170 $\mu\text{g/l}$ and 5.4 $\mu\text{g/l}$ respectively. Additionally, sample MW-45 contained benzene at 9,100 $\mu\text{g/l}$, ethylbenzene at 1,100 $\mu\text{g/l}$, toluene at 2,800 $\mu\text{g/l}$, 1,3,5 - trimethylbenzene at 620 mg/l, o-xylene at 1,700 $\mu\text{g/l}$ and mp-xylene at 3,600 $\mu\text{g/l}$. A field duplicate was also analyzed for sample MW-45 and exhibited similar results when compared to the original MW-45 data. No detections of VOCs were reported in the sample collected from MW-61.

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4.4 Organochlorine Pesticides

The groundwater sample and duplicate sample collected from MW-61 were analyzed for organochlorine pesticides using SW-846 Method 8081A. Table 6 presents organochlorine pesticide analytical results. No organochlorine pesticides were detected at levels exceeding the reporting limits ($0.5 \mu\text{g/l}$). However, endrin aldehyde was detected in sample MW-61 at a concentration of $0.15 \mu\text{g/l}$. Endrin aldehyde was also found in the equipment blank, trip blank and laboratory method blank at similar levels. Therefore, it is likely that this result is due to laboratory contamination. Additionally, several compounds in both the equipment blank and the trip blank were qualified as estimated by the laboratory due to low surrogate recoveries (31% and 4% respectively). A low surrogate recovery was also observed in the second method blank (50%). No detections were reported in the duplicate sample collected at MW-61.

4.5 Performance Evaluation Samples

4.5.1 Volatile Organic Compounds

A PE sample, obtained from Analytical Products Group, Inc. (APG), of North Olmsted, Ohio, was submitted to NEL for analysis. NEL reported positive results for 21 VOCs in the PE sample and each of these results were within APG's acceptable limits. Results reported as non-detected by NEL are not included in Table 7, since APG did not spike these analytes into the PE sample.

4.5.2 Ethylene Dibromide

A PE sample, obtained from APG, was submitted to NEL for analysis by Method 504.1. The reported NEL result was within acceptance criteria for the PE sample. Table 8 contains a summary of the PE result and the APG acceptance criteria.

4.6 Quality Control

A quality control (QC) review of the NEL data summary reports has been performed. From the information presented, it appears that all reported QC criteria (surrogates, MS/MSD, laboratory control samples (LCS), and method blanks) met acceptance limits with two exceptions. One surrogate recovery in both the Method 8081A Trip Blank

and Equipment blank was below acceptance criteria and affected analytes have been qualified as estimated by the laboratory. Since each of these affected analytes was reported as non-detected in the primary sample, no additional qualifiers appear necessary.

However, while the submitted QC information appears acceptable, it was also noted that complete QC summary information necessary to evaluate the accuracy of the NEL data was not included in the laboratory report. For example, QC summary information for VOCs (MS/MSD recoveries), TPHg (MS/MSD recoveries) organochlorine pesticides (MS/MSD and LCS recoveries), and EDB (surrogate recoveries) did not appear to be submitted. Additionally, surrogate recoveries for the VOC and TPHg LCS samples were not included in the NEL reports. In order to evaluate the accuracy of the NEL reports, this information should be submitted for review.

4.6.1 Ethylene Dibromide

Comparability of the TechLaw and George AFB data cannot be assessed for ethylene dibromide since it appears that TechLaw's detection limits were four orders of magnitude lower than the detection limits reported by George AFB. Therefore, positive results reported by the TechLaw laboratory were reported as non-detected by the George AFB laboratory.

4.6.2 Total Petroleum Hydrocarbons

Results for TechLaw and George AFB split samples appear similar for TPHg and TPHd.

4.6.3 Volatile Organic Compounds

The reported NEL VOC detection limits were significantly higher than those reported by George AFB. It is possible that some of NEL detection limits were elevated due to the dilution of samples. The elevated detection limits do not appear to adversely affect the TCE results from wells MW-45, NZ-39, and NZ-51. However, the result for TCE at MW-61 is less than 5 $\mu\text{g/l}$. Therefore, it is possible that TCE is present in MW-61 at a concentration below the detection limit. Also, elevated detection limits were noted for the equipment blank sample and the trip blank sample from NEL, but no explanation for these elevated detection limits has been provided. These blank detection limits are between 20 $\mu\text{g/l}$ and 5 $\mu\text{g/l}$, yet no analytes appear to have been detected in the blanks.

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In addition, dilutions are not normally performed on blank samples. Therefore, the usability of these blank results appears compromised. Furthermore, positive sample results that are less than the reported blank detection limits may need to be qualified as estimated.

With the exception of TCE, the VOC results for TechLaw and George AFB split samples appear comparable for sample NZ-39. However, trichloroethene comparability for sample NZ-39 could not be assessed since the George AFB result was qualified as rejected. Furthermore, while MW-61 results appear comparable, the George AFB results are qualified due to a matrix effect being present yet the matrix effects are not clearly defined. Therefore, comparability for MW-61 cannot be completely assessed. Finally, comparability of MW-45, MW-45 field duplicate and NZ-51 data cannot be evaluated since the George AFB data for these samples have been qualified rejected.

5.0 Conclusions and Recommendations

Based on the November 1999 analytical results, there appears to be reasonable agreement between the Air Force's laboratories and NEL Laboratory. In addition, the results of the PE sample indicate that NEL is accurately reporting VOC results. However, the missing QA/QC data from the NEL Laboratory data packages should be reviewed.

The compound EDB was detected at monitoring well MW-45 at a concentration of 0.019 $\mu\text{g/l}$ in November 1998. The November 1999 EDB results (0.0169/0.0166 $\mu\text{g/l}$) confirm this detection. Both the November 1998 and November 1999 results are below the MCL for EDB, which is 0.05 $\mu\text{g/l}$. In order to evaluate the extent of EDB in groundwater, it is recommended that monitoring wells upgradient of MW-45 be analyzed for EDB during the next sampling round. Wells upgradient of MW-45 include EX-7, MW-67, MW-26, MW-51, MW-50, MW-24, and MW-85. Since monitoring wells MW-67, EX-7, MW-50, and MW-24 all contained free product in November 1999, it is recommended that monitoring wells MW-26, MW-51, and MW-85 be sampled and analyzed for EDB during the next sampling round.

Pesticides were monitored at well MW-61 to evaluate the presence of dieldrin. Dieldrin has been detected previously at monitoring wells NZ-63 and NZ-64. Due to the lack of a monitoring well located upgradient and in close proximity of NZ-63 and

NZ-64, it was decided to sample MW-61. MW-61 is located approximately upgradient of NZ-63 and NZ-64, however MW-61 is located approximately 5,000 feet from NZ-63 and NZ-64. Dieldrin was not detected in the sample collected from MW-61 in November 1999. The absence of dieldrin at MW-61 indicates that the source of dieldrin in groundwater is not upgradient of MW-61 and is probably located closer to wells NZ-64 and NZ-65. Additional monitoring wells located upgradient of NZ-63 and NZ-64 are necessary to define the source of dieldrin in groundwater.

The presence of TCE at a concentration of 170 $\mu\text{g/l}$ at monitoring well NZ-39 confirms the trend of increasing TCE at this well. Additional wells, that will be installed in the vicinity of NZ-39 as part of the data gaps investigation, will help define the extent of TCE in groundwater in this area. Monitoring well NZ-39 should continue to be monitored by the Air Force during the semi-annual groundwater monitoring program.

Analytical results from monitoring well NZ-51 indicate that TCE is present at 5.4 $\mu\text{g/l}$, just above the MCL. Concentrations of TCE at NZ-51 since July 1997 have been between 4.6 $\mu\text{g/l}$ and 6.1 $\mu\text{g/l}$. Previous concentrations of TCE at NZ-51 have been as high as 12 $\mu\text{g/l}$ (June 1996). NZ-51 should continue to be monitored by the Air Force and additional monitoring wells and/or grab groundwater samples should be collected to define the extent of TCE contamination in groundwater at the FT-20 site.

Tables

Table 1

**Sample Summary
Split Sampling Event, November 1999
George Air Force Base**

Operable Unit	Monitoring Well	Date Sampled	TechLaw/EPA Analyses		GAFB Analyses
OU-1	NZ-39	11/16/99	EPA 8260B	VOCs	EPA 8260B VOCs
OU-2	MW-45	11/16/99	EPA 8260B EPA 8260B EPA 504.1 EPA 8015B	VOCs, TPHg EDB TPHd	EPA 8260B VOCs, EPA 8260B TPHg EPA 504.1 EDB EPA 8015B TPHd
OU-2	MW-61	11/16/99	EPA 8260B EPA 8081A Pesticides	VOCs	EPA 8260B VOCs
OU-2	NZ-51	11/16/99	EPA 8260B	VOCs	EPA 8260B VOCs

Table 2

Quality Control Samples
Split Sampling Event, November 1999
George Air Force Base

Location	Sample Type	Analysis
MW-45	MS/MSD	EPA 8260B VOCs
		EPA 8260B TPHg
		EPA 504.1 EDB
		EPA 8015B TPHd
	Field Duplicate	EPA 8260B VOCs
		EPA 8260B TPHg
		EPA 504.1 EDB
		EPA 8015B TPHd
	Equipment Blank	EPA 8260B VOCs
		EPA 8260B TPHg
		EPA 504.1 EDB
		EPA 8015B TPHd
	Trip Blank	EPA 8260B VOCs
		EPA 8260B TPHg
		EPA 504.1 EDB
		EPA 8015B TPHd
MW-61	MS/MSD	EPA 8081A Pesticides
	Field Duplicate	EPA 8081A Pesticides
	Equipment Blank	EPA 8081A Pesticides
	Trip Blank	

		EPA 8081A Pesticides
Analytical Products Group	PE Sample, EDB	EPA 504.1 EDB
	PE Sample, VOCs	EPA 8260B VOCs

Table 3

**EPA Method 504.1 Results
Split Sampling Event, November 1999
George Air Force Base**

TechLaw Sample Number	TL99-A0001		TL99-A0002		TL99-A0003		TL99-A0004	
Sampling Location	MW-45		MW-45 Field Duplicate		Equipment Blank		Trip Blank	
Matrix	Groundwater		Groundwater		DI Water		DI Water	
Parameter	$\mu\text{g/l}$		$\mu\text{g/l}$		$\mu\text{g/l}$		$\mu\text{g/l}$	
	EPA	GAFB	EPA	GAFB	EPA	GAFB	EPA	GAFB
DBCP	0.02 U	NA	0.02 U	NA	0.02 U	NA	0.02 U	NA
EDB	0.0169	100 U	0.0166	100 U	0.01 U	100 U	0.01 U	100 U

U = Not detected at the reported level

NA = Not analyzed

EDB = Ethylene dibromide

DBCP = Dibromochloropropane

Table 4
Total Petroleum Hydrocarbon Results
SW-846 Methods 8260B/8015B
Split Sampling Event, November 1999
George Air Force Base

TechLaw Sample Numbers	TL99-C0001/C0006		TL99-C0002/C0007		TL99-C0003/C0008		TL99-C0004/C0009	
Sampling Location	MW-45		MW-45 Field Duplicate		Equipment Blank		Trip Blank	
Matrix	groundwater		groundwater		DI Water		DI Water	
TPH	mg/l		mg/l		mg/l		mg/l	
	EPA	GAFB	EPA	GAFB	EPA	GAFB	EPA	GAFB
Gasoline Range Organics ¹	41E	39.1	40E	40.5	0.06	0.1 U	0.05 U	NA
Diesel Range Organics ²	2.2	2.0	2.5	2.2	0.5 U	1.0 U	0.5 U	NA

NA = Not Analyzed

U = Not detected at the reported level

E = Concentration exceeded the calibration range and the reported value should be considered an estimate

¹EPA samples analyzed by SW-846 Method 8260B, GAFB samples analyzed by SW-846 Method 8015B

²EPA and GAFB samples analyzed by SW-846 Method 8015B

Table 5

Volatile Organic Compound Results
SW-846 Method 8260B
Split Sampling Event, November 1999
George Air Force Base

TechLaw Sample Number	TL99-B0001		TL99-B0002		TL99-B0007		TL99-B0008		TL99-B0009		TL99-B0003		TL99-B0004	
Sampling Location	MW-45		MW-45 Field Duplicate		MW-61		NZ-39		NZ-51		Equipment Blank ¹		Trip Blank ²	
Matrix	groundwater		groundwater		groundwater		groundwater		groundwater		DI Water		DI Water	
Volatile Organic Compounds	ug/l		ug/l		ug/l		ug/l		ug/l		ug/l		ug/l	
	EPA	GAFB	EPA	GAFB	EPA	GAFB	EPA	GAFB	EPA	GAFB	EPA	GAFB	EPA	GAFB
Benzene	9100	12000 R	9300	10000 R	5 U	0.4 M	5 U	0.4 U	5 U	0.4 R	20 U	2.9 M	5 U	0.4 R
Chloroform	500 U	30 R	500 U	3.0 R	5 U	0.15 M	5 U	0.4	5 U	0.42 R	20 U	0.3 M	5 U	0.11 R
1,1-Dichloroethane (1,1-DCA)	500 U	33 R	500 U	30 R	5 U	0.4 M	5 U	0.4 U	5 U	0.2 R	20 U	0.4 M	5 U	0.4 R
1,2-Dichloroethane (1,2-DCA)	500 U	60 R	500 U	220 R	5 U	0.6 M	5 U	0.6 R	5 U	0.6 R	20 U	0.6 M	5 U	0.6 R
cis-1,2-Dichloroethene (cis 1,2-DCE)	500 U	120 R	500 U	12 R	5 U	1.2 M	5 U	0.5	5 U	1.2 R	20 U	1.2 M	5 U	1.2 R
Ethylbenzene	1100	1500 R	1100	1200 R	5 U	0.6 U	5 U	0.6 U	5 U	0.6 R	20 U	0.93	5 U	0.6 R
Isopropylbenzene	500 U	110 R	500 U	5.0 R	5 U	0.5 M	5 U	0.5 U	5 U	0.5 R	20 U	0.5 M	5 U	0.5 R
Methylene chloride	500 U	73 R	500 U	12 R	5 U	0.37 M	5 U	3.0 U	5 U	0.3 R	20 U	0.3 M	5 U	0.24 R

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Table 5

Volatile Organic Compound Results
SW-846 Method 8260B
Split Sampling Event, November 1999
George Air Force Base

TechLaw Sample Number	TL99-B0001		TL99-B0002		TL99-B0007		TL99-B0008		TL99-B0009		TL99-B0003		TL99-B0004	
Sampling Location	MW-45		MW-45 Field Duplicate		MW-61		NZ-39		NZ-51		Equipment Blank ¹		Trip Blank ²	
Matrix	groundwater		groundwater		groundwater		groundwater		groundwater		DI Water		DI Water	
Volatile Organic Compounds	ug/l		ug/l		ug/l		ug/l		ug/l		ug/l		ug/l	
	EPA	GAFB	EPA	GAFB	EPA	GAFB	EPA	GAFB	EPA	GAFB	EPA	GAFB	EPA	GAFB
Naphthalene	500 U	340 R	500 U	4.0 R	5 U	0.4 R	5 U	0.4 R	5 U	0.4 R	20 U	0.4 R	5 U	0.4 R
n-Propylbenzene	500 U	130 R	500 U	4.0 R	5 U	0.4 M	5 U	0.4 U	5 U	0.4 R	20 U	0.4 M	5 U	0.4 R
Tetrachloroethene (PCE)	500 U	140 R	500 U	14 R	5 U	1.4 M	5 U	1.4 U	5 U	4.0 R	20 U	1.4 M	5 U	1.4 R
Toluene	2800	4000 R	2800	3200 R	5 U	1.1 U	5 U	1.1 U	5 U	1.1 R	20 U	1.8	5 U	1.1 R
1,1,2-Trichloroethane	500 U	100 R	500 U	10 R	5 U	1.0 U	5 U	1.0 U	5 U	1.0 R	20 U	1.0 U	5 U	1.0 R
Trichloroethene	500 U	100 R	500 U	4.5 R	5 U	0.76 M	170	106 R	5.4	5.5 R	20 U	1.0 M	5 U	1.0 R
1,2,4-Trimethylbenzene	500 U	790 R	500 U	740 R	5 U	1.3 U	5 U	1.3 U	5 U	1.3 R	20 U	1.3 U	5 U	1.3 R
1,3,5-Trimethylbenzene	620	250 R	580	5.0 R	5 U	0.5 U	5 U	0.5 U	5 U	0.5 R	20 U	0.55	5 U	0.5 R

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Table 5

**Volatile Organic Compound Results
SW-846 Method 8260B
Split Sampling Event, November 1999
George Air Force Base**

TechLaw Sample Number	TL99-B0001		TL99-B0002		TL99-B0007		TL99-B0008		TL99-B0009		TL99-B0003		TL99-B0004	
Sampling Location	MW-45		MW-45 Field Duplicate		MW-61		NZ-39		NZ-51		Equipment Blank ¹		Trip Blank ²	
Matrix	groundwater		groundwater		groundwater		groundwater		groundwater		DI Water		DI Water	
Volatile Organic Compounds	ug/l		ug/l		ug/l		ug/l		ug/l		ug/l		ug/l	
	EPA	GAFB	EPA	GAFB	EPA	GAFB	EPA	GAFB	EPA	GAFB	EPA	GAFB	EPA	GAFB
o-Xylene	1700	2400 R	1700	1700 R	5 U	1.1 U	5 U	1.1 U	5 U	1.1 R	20 U	0.83 J	5 U	1.1 R
m,p-Xylene	3600	5000 R	3500	4100 R	5 U	1.8 U	10 U	1.5	5 U	1.8 R	40 U	3.1	10U	1.8 R

U = Not detected at the reported level

R = Rejected

J = Result is an estimate

M = A matrix effect was present.

NA = Not analyzed

1. GAFB data contained three Equipment Blanks. Since EB11169A was reported with previous GAFB samples, only this data has been included in the above table

2. GAFB data contained two Trip Blanks. Since TB1169 was reported with previous GAFB samples, only this data has been included in the above table

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Table 6

Organochlorine Pesticides Results
U.S. EPA Samples
SW-846 Method 8081A
Split Sampling Event, November 1999
George Air Force Base

TechLaw Sample Number	TL99-D0001	TL99-D0002	TL99-D0003	TL99-D0004
Sampling Location	MW-61	MW-61 Field Duplicate	Equipment Blank	Trip Blank
Matrix	groundwater	groundwater	DI water	DI water
Organochlorine Pesticides	ug/l	ug/l	ug/l	ug/l
Aldrin	0.5 U	0.5 U	0.5 U	0.5 U
alpha-BHC	0.5 U	0.5 U	0.5 U	0.5 U
beta-BHC	0.5 U	0.5 U	0.5 U	0.5 U
delta-BHC	0.5 U	0.5 U	0.5 U	0.5 U
gamma-BHC (Lindane)	0.5 U	0.5 U	0.5 U	0.5 U
Alpha-chlordane	0.1 U	0.1 U	0.1 U	0.1 U
Chlordane	1.0 U	1.0 U	1.0 U	1.0 U
Gamma-chlordane	0.1 U	0.1 U	0.1 U	0.1 U
Dieldrin	0.5 U	0.5 U	0.5 UJ	0.5 UJ
Endosulfan I	0.5 U	0.5 U	0.5 U	0.5 U
Endosulfan II	0.5 U	0.5 U	0.5 UJ	0.5 UJ
Endosulfan sulfate	0.5 U	0.5 U	0.5 UJ	0.5 UJ
Endrin	0.5 U	0.5 U	0.5 UJ	0.5 UJ
Endrin aldehyde	0.15B	0.5 U	0.13B	0.11B
Heptachlor	0.5 U	0.5 U	0.5 U	0.5 U
Heptachlor epoxide	0.5 U	0.5 U	0.5 U	0.5 U
Methoxychlor	2.0 U	2.0 U	2.0 UJ	2.0 UJ
Toxaphene	3.0 U	3.0 U	3.0 UJ	3.0 UJ

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B = Compound also found in associated method blank at 0.1 ug/l

U = Not detected at the reported level

UJ = Estimated detection limit due to low surrogate recoveries

TechLaw Sample Number	TL99-B0006		
Sampling Location	PE Sample		
Matrix	Water		
Volatile Organic Compounds	ug/l		
	Reporte d	True Value	Acceptable Limits
Benzene	29	29.2	20.9-37.9
Bromodichloromethane	50	44.7	31.6-58.2
Bromoform	53	46	29.8-62.9
Carbon tetrachloride	31	29.2	18.2-41.2
Chlorobenzene	38	38.5	27.3-48.9
Chloroform	19	18.3	13-23.8
Dibromochloromethane	48	44.1	28.7-58.5
1,2-Dichlorobenzene (o-DCB)	39	37.6	26.4-47.7
1,3-Dichlorobenzene (m-DCB)	24	22.6	15.8-28.5
1,4-Dichlorobenzene (p-DCB)	21	19.8	13.5-25.9
1,2-Dichloroethane (1,2-DCA)	35	34.8	24.1-46.6
trans-1,2-Dichloroethene	27	24.1	14.7-36.8
trans-1,3-Dichloropropene	21	19.9	14.9-25.5
Ethylbenzene	33	30.7	20.6-40
Methylene chloride	34	35.1	
1,1,2,2-Tetrachloroethane	40	38.4	27.3-51.2
Tetrachloroethene (PCE)	38	45.4	30-58.3
Toluene	30	30.3	21.6-38.1
1,1,1-Trichloroethane	38	35.5	23.1-46.8
1,1,2-Trichloroethane	40	40.9	29.3-54.1

Trichloroethene	43	39.6	25.7-51.2
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1. Only analytes actually present in the PE sample are listed in this table. All other analytes reported as non- detected by the laboratory.

Table 8

**EPA Method 504.1 Performance Evaluation Results
Split Sampling Event, November 1999
George Air Force Base**

TechLaw Sample Number	TL99-A000		
Sampling Location	PE Sample		
Matrix	Water		
Parameter	ug/l		
	Reported	True Value	Acceptable Limits
DBCP	NA	NA	NA
EDB	0.0897	0.083	0.050-0.116

NA = Not analyzed

Attachment A
Sample Location Maps

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Attachment B

Chain of Custody Forms

Attachment C
Laboratory Reports

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Attachment D

Field Log

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